

REMARKS

Claims 120 -124 and 127-130 are presently pending in the application. Claims 120, 122, 124 and 127 are independent claims.

The specification has been amended to add a "Cross-Reference to Related Applications" subheading and to update the status of the parent application, now issued. Claims 118, 119, 125, 126, and 131-140 have been canceled without prejudice to the filing of one or more divisional applications directed to the subject matter thereof. Further, claims 120-124 and 127 have been amended to delete the non-elected subject matter. No new matter has been added by these amendments and entry is respectfully requested. In view of these amendments, it is respectfully requested that the Examiner's objections to the claims as containing non-elected subject matter be withdrawn, and it is submitted that all of the pending claims are now allowable over the prior art of record.

In the present Office Action, the Examiner has rejected claims 120-124 and 127-130 under 35 U.S.C. § 112, first paragraph, as lacking enablement. The Examiner argues that while the specification is enabled for pharmaceutical compositions, it does not provide enablement for "any composition". The Examiner argues that a composition is a product of mixing or combining various elements or ingredients. Due to the lack of predictability in the art, the Examiner contends, without guidance or direction as to what type of composition is being prepared, one of ordinary skill in the art would not know what elements or ingredients to combine or how to combine them with the calixpyrrole macrocycle to prepare the claimed compositions. The Examiner thus concludes that it would require undue experimentation to prepare compositions other than pharmaceutical compositions (described at pages 40-42), since

there is no direction or guidance as to what other types of compositions can be prepared and how these compositions can be prepared. Applicants respectfully traverse this rejection as follows.

Several different types of compositions are described in the specification, that is, products of mixing or combining various elements or ingredients in addition to a calixpyrrole. Such compositions may be used for a variety of applications other than pharmaceutical formulations, including, without limitation, separation (using solid supports or free-standing systems) and sensing (colorimetric approaches, electrochemical sensor generation and use, and ion selective electrodes). The following citations to sections of the specification (using the paragraph numbering in the published application, which corresponds to the application as filed, for convenience), which describe the use of calixpyrroles and compositions thereof in such applications, are meant to be exemplary, not limiting.

Paragraph [0021] teaches that calyx[n]pyrroles bind anions and neutral molecular species in solution and in the solid state in such a selective and effective way that the anions or neutral molecular species can be separated from other anions or neutral molecular species. Such properties may be used to remove biological ions or neutral molecular species for medical use or to remove undesirable ions or neutral molecular species from environmental sources, for example.

Paragraphs [0024], [0049], [0195], [0196], and Example 10 describe calyx[n]pyrroles attached to solid supports for selective separation of a variety of molecules, such as by Hydrogen-Bonded Liquid Chromatography. Use of such supported calixpyrroles for separating molecules, anions, or cations from mixtures is further described in paragraphs [0056] and [0190], for example. Specific solid supports (such as silica gels, polymer beads, clays and zeolites) and forms of such supports (such as chromatography columns, thin layer chromatographic supports,

and electrophoresis gels) are described. Further, the preparation of two specific derivatized silica gels is described in paragraph [0196] and Example 10. Thus, one skilled in the art would be able to prepare compositions for separation which contain calixpyrroles, that is, products which contain the calixpyrrole and another element (here, a solid support such as silica gel).

The electrochemical detection of an anion, cation, or neutral molecule by assembling an anion, cation, or neutral molecule-selective electrode containing a conductive body, polymer, and calixpyrrole is described in paragraphs [0058] – [0060] and in Example 10, particularly paragraphs [0367] – [0368]. Example 10 explains that such ion selective electrodes allow a different means of effecting anion sensing. As stated in paragraph [0367], "Macrocycles of the present invention may be used to generate ion selective electrodes in a further use embodiment. Data illustrated in Table 8 for anion selective electrodes synthesized by the present inventors indicate that the selectivity and preferential binding observed in solution and in separation chemistry, described in examples herein, is consistent with anion selective electrode technology." Specific details describing the preparation of ion selective electrodes, which does not represent new technology and hence something for which cognizance can be assumed for one of ordinary skill in the art, appear in the footnotes to Table 8. Thus, the preparation, use, viability, and importance of these systems are fully enabled. Finally, methods of making calixpyrrole-ion selective electrodes are described in detail in paragraph [0368]. Accordingly, electrode compositions are fully enabled by these descriptions in the specification.

Calixpyrroles may be used to remove pertechnetate from nuclear waste by contacting the waste with calixpyrrole. Similarly, environmental pollutants may be removed from environmental sources (see, for example, paragraphs [0062] – [0063], [0201] – [0202], and Example 12.) This application is different from the solid phase approaches, as evidenced by the

statement in Example 12, "Additionally, a multi-phase extraction system is envisioned where calix[n]pyrrole in a first phase extracts anionic waste from another phase, and the waste then is separated for storage or disposal." The use of the word "additionally" implies that the method is distinct from the solid phase approaches which precede it (and follow it) in the discussion. Further, Applicants note that the use of extraction to effect separation of wastes is and was at the time of filing well known in the area of cationic (as opposed to anionic) waste remediation. One of ordinary skill in the art thus would appreciate in light of the present disclosure that such known methodologies could be applied for anionic wastes by simply replacing a cation-targeting extractant by a calix[n]pyrrole, whose utility for anion binding is well documented in the application.

Additionally, chromatography columns or sensors containing solid supports bound to calixpyrroles are described in paragraphs [0064] and [0203]. Electrochemical sensors may be prepared by electropolymerizing a macrocycle onto the surface of a solid support or by encapsulating a macrocycle into a membrane attached to the surface of a solid support. The use of calix[n]pyrroles to generate electrochemical sensors is described in Example 8, specifically, the synthesis and use of a ferrocene-calixpyrrole derivative. The utility of these systems as electrochemical sensors is demonstrated explicitly through the data tabulated in Table 1, which shows that the utility is operative. Specifically, one of ordinary skill in the art would appreciate upon reviewing the data in this table that there are differences in the response generated by different anions, thus, as has been well demonstrated in the cation sensing literature, allowing for sensing. This utility is underscored by the statement in paragraph [0324], "calixpyrroles can be incorporated into devices (in this case an electrochemical anion sensor) and operate successfully".

Based on these descriptions from the specification, Applicants respectfully submit that a variety of different calixpyrrole compositions are fully described and enabled, and that the claims should not be limited to pharmaceutical compositions. Accordingly, reconsideration and withdrawal of the § 112, first paragraph rejection are respectfully requested.

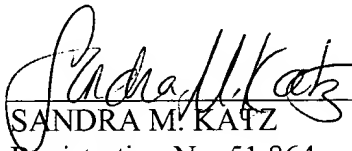
In view of the preceding Amendments and Remarks, it is respectfully submitted that all of the pending claims are in compliance with § 112, patentable, distinct from the prior art of record, and in condition for allowance. A Notice of Allowance is respectfully requested.

Respectfully submitted,

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